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SANITARY ENGINEERING RESEARCH ADVISORY COMMITTEE
AGENDA AND WORKING NOTES
PROCEEDINGS OF MEETING (1ST) HELD AT CINCINNATI, OHIO ON JANUARY 3-4, 1957

PUBLIC HEALTH SERVICE, WASHINGTON, D.C.

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SANITARY ENGINEERING RESEARCH ADVISORY COMMITTEE

AGENDA AND WORKING NOTES

First Meeting

January 3-4, 1957

Held At

THE ROBERT A. TAFT SANITARY ENGINEERING CENTER

Cincinnati, Ohio

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16. Abstracts

The agenda and working notes of the first meeting of the Sanitary Engineering Research Advisory Committee are presented. Topics covered include air pollution, water supply and water pollution, mild and food, radiological health, training, and epidemiology, toxicology, and biostatistics. Excerpts of laws are also included: the Public Health Service Act, Air Pollution Act, and Water Pollution Act.

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C O N T E N T S

	PAGE
Agenda	1
SEC Organization Chart	3
Air Pollution	4
Water Supply and Water Pollution	9
Milk and Food	14
Radiological Health	20
Training	24
Epidemiology, Toxicology, and Biostatistics	28
Excerpts of Laws	
Public Health Service Act	32
Air Pollution Act	35
Water Pollution Act	37
About the Committee Members	39

SANITARY ENGINEERING RESEARCH ADVISORY COMMITTEE

First Meeting

January 3-4, 1957

A G E N D A

January 3

9:00 a.m. - 10:00 a.m.	Opening Remarks - M. D. Hollis Announcements
10:00 a.m. - 12:30 p.m.	Tour of Center
12:30 p.m. - 1:30 p.m.	Lunch

Discussion of Individual Programs

1:30 p.m. - 2:05 p.m.	Air Pollution
2:05 p.m. - 2:40 p.m.	Water Supply and Water Pollution Control
2:40 p.m. - 3:15 p.m.	Milk and Food
3:15 p.m. - 3:30 p.m.	Break
3:30 p.m. - 4:05 p.m.	Radiological Health
4:05 p.m. - 4:40 p.m.	Training
4:40 p.m. - 5:15 p.m.	Epidemiology and Toxicology
6:30 p.m.	Social Hour and Dinner Mariemont Inn

SANITARY ENGINEERING RESEARCH ADVISORY COMMITTEE

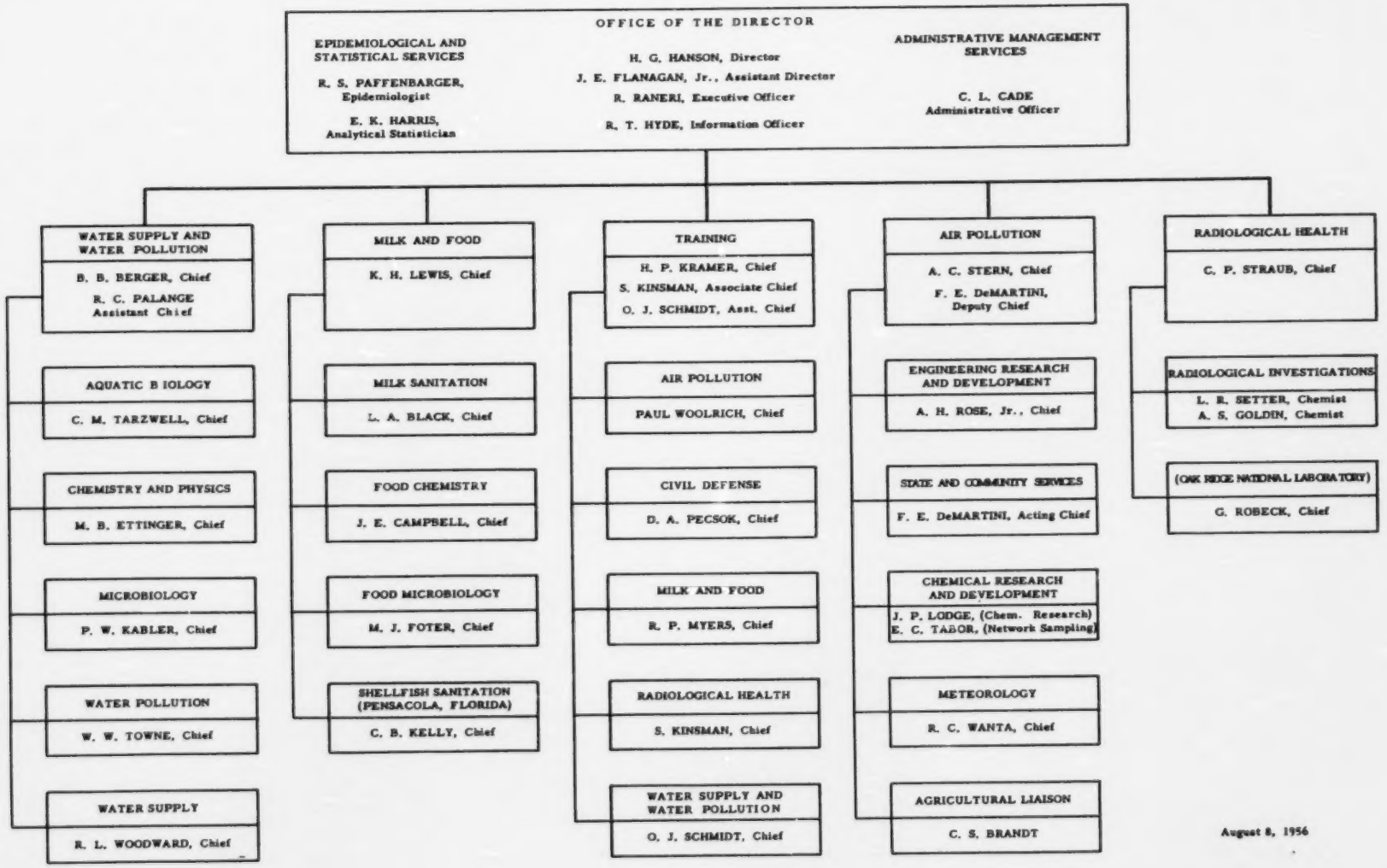
A G E N D A

January 4

9:30 a.m. - 12:30 p.m.	Relationships with Universities and Teaching Centers - Review of sanitary engineering manpower and research trends - Public Health Service legislation of interest to the Universities - Discussion: How the resources available through the Public Health Service can best be utilized to support the teaching and research efforts of the Universities toward meeting the sanitary engineering problem of the future.
12:30 p.m. - 1:30 p.m.	Lunch
2:00 p.m. - 4:30 p.m.	Executive Session of the Committee - Summary and Recommendations - Plans for next meeting of the Committee

TENTATIVE ORGANIZATION CHART

ROBERT A. TAFT SANITARY ENGINEERING CENTER



August 8, 1956

COMMUNITY AIR POLLUTION RESEARCH PROGRAM

I. OVERALL PROBLEM AND PROGRAM OBJECTIVES

The problem is Nation-wide. It is estimated that 10,000 United States communities have a local air pollution problem. The economic cost of air pollution, without any assessment of the dollar value of health effects, is estimated as of the order of three billion dollars per year. Effects on public health are suspected, but not yet proven.

The over-all program objectives are to carry out research on the sources, extent, behavior, effects (other than on health), and control of community air pollution, and to encourage and collaborate with Federal, State, community, and other organizations in related activities. This includes:

1. Design, testing, and development of methods and devices for chemical and physical measurements and for studying the complicated interchemical reactions of air pollutants.

2. Physical measurement, identification, and tracing of air pollutants.

3. Development of methods and devices for controlling or preventing the introduction of air pollutants into the atmosphere.

4. Furnishing technical guidance and consultation to States and communities in establishing and operating community air pollution control programs.

II. PRESENT ACTIVITIES

At the start of FY 1959, the Community Air Pollution Program will have completed its third year. The first year (FY 1956) was devoted mainly to planning and recruiting. The second year is being used primarily for the development of staff and the initiation of laboratory and field approaches. In the third year (FY 1958) these investigations will yield initial findings to provide a firmer orientation for research and technical assistance in FY 1959 and later.

As an aid to development of a logical program within the Service and throughout the Nation, research planning conferences in the special field of air pollution have been held. A current meeting at the Center, December 18 - 20, 1956, includes medical and nonmedical representatives from the leading Federal and non-Federal agencies conducting air pollution research.

III. RESEARCH PLANS

1. Engineering Research and Development. Investigations into fundamental factors affecting the performance and selection of air pollution control devices will be continued. Such studies will include devices to prevent the discharge to the atmosphere of particulate matter, gases, vapor, and odor, with increased emphasis on the latter three, and will involve not only existing classes of control devices but investigations into as yet untried control principles.

Both laboratory and field studies will be made of discharges to the atmosphere from specific processes and industries, with particular emphasis on refuse incineration and the internal combustion engine, and on the petroleum, metallurgical, and chemical industries. Particular attention will be directed to the reduction of the oxides of nitrogen and hydrocarbon vapors from the discharges from such processes and industries.

2. Chemical Research and Development. The immediate goal is to obtain sufficient information about the nature and quantity of contaminants in the air to allow its useful correlation with data on the effects of these contaminants. Working with the Community Air Pollution Medical Program of the PHS, the ultimate goal of such correlation is to reveal safe atmospheric levels for such contaminants with respect to a variety of criteria such as carcinogenesis, acute and chronic toxicity, and others. To this end, detailed analysis of air contaminants will be intensified by bringing to bear more penetrating and precise chemical and physical analytical equipment and procedures.

A further major objective of the detailed analysis is to learn which types of measurements can in the future be ignored as nonessential to an understanding of the problem, thereby simplifying future instrumentation and analysis.

Parallel studies will be continued on the kinetic aspects of how complicated chemicals are synthesized or produced in the atmosphere from either simpler or more complex initial effluents from industrial, domestic, and meterial processes. Included will be study of the role of contaminants in what we normally consider "clean" or nonurban air in chemical reactions occurring over urban communities. Work will also continue on the development and evaluation of simple analytical techniques, largely chemical in nature, for field-survey use.

3. National Air Sampling Network. This Network provides basic comparative data on pollution of urban and nonurban areas of the United States, to allow study of trends with time; of effects of geographic, demographic, meteorological, and other variables; and correlation with pollution effects. This compilation of basic data will constitute a key to intelligent planning by Federal, State, and municipal agencies. The number of urban and nonurban stations will remain essentially unchanged, but coverage will be intensified by increased sampling frequency and the employment of a greater number and variety of measurements. The Network laboratory will continue to provide analytical and reference services to both State and community air pollution control agencies, as well as to the field studies of the Community Air Pollution Program.

4. Instrument Development. Work will be concentrated on the design, construction, and field testing of automatic devices to measure and record the extent of pollution of the air by specific pollutants and by classes of pollutants. The goal will be devices of low enough cost and sufficient simplicity to allow their widespread use in the study of community problems. In addition, there will be development of devices to measure the effluent to the atmosphere from specific processes, such as the internal combustion engine, with the ultimate goal being equipment that can be effectively used by the man on the "firing line", e.g., the automobile safety lane.

5. Meteorology (conducted by USWB Staff at SEC). The continuing assembly of air pollution-related climatological data and the continuing study of air pollution survey methodology will be applied to the design of a major urban experiment to answer fundamental questions in urban air mass and energy balances important in the prediction of urban smog formation and dispersal. As a parallel approach to these same questions, physical and analog modeling of atmospheric processes on the urban community scale will be developed.

The development of regional forecasting of weather conditions of high air pollution potential should soon permit routine use. Similarly, the applicability of data on urban diffusion patterns to area planning and zoning should allow increased field trials of this technique for avoiding air pollution problems. Studies of the relation of micrometeorological variables to air pollution effects will continue.

6. Agriculture. The Department of Agriculture may soon be supporting extensive studies on the basic physiological responses of plants and animals to air pollution, and in cooperation with State agricultural experiment stations conduct studies of these effects in specific areas. Jointly with the Public Health Service, it will carry out plant and livestock damage area survey and mapping, as well as the preparation of evaluations of data.

The Department of Agriculture liaison scientist stationed at the Center advises the Community Air Pollution Program on matters relating to agriculture and expedites the securing of expert advice from the Department of Agriculture as it may be necessary. He also aids in establishment of criteria and research, in the use of plants and other organisms as biological instruments for detecting air pollution. This involves the conduct of research and surveys of research findings and opinions relative to the possible effects of air pollution on or in relation to agricultural products, procedures or processes.

IV. RESEARCH CONTRACTS WITH NON-FEDERAL AGENCIES

The following research contracts are in effect or contemplated:

1. Development of a "universal" air pollution recording instrument. (State College of Washington, Pullman, Washington.)

2. Study and evaluation of compression methods of sampling. (Franklin Institute, Philadelphia, Pa.)

3. Carbon-dating studies of airborne particulates. (Under negotiation.)

4. Development of high-temperature filter fabric. (Contemplated.)

5. Atlas of photomicrographs of particulates. (Contemplated.)

6. Automatic air sampling device for use with solid adsorbents. (Contemplated.)

V. TECHNICAL ASSISTANCE

State-wide, regional and community surveys will be conducted in cooperation with State and local interests to determine the nature, effects and sources of air pollution and to develop therefrom adequate control programs. Both major area surveys of one to two years duration and shorter term operations aimed at the solution of particular local problems, where Federal assistance is requested by State and local authorities, are contemplated.

Technical consultation services will include: appraisal of local air pollution problems and determination of local program needs; guidance for improvement of administrative and technical practices; assistance in setting up State and local study or survey projects; evaluation and interpretation of survey findings.

Information activities will meet the increased needs of expanded State and local air pollution control programs. Air pollution survey and study reports, manuals of practice, bulletins, circulars, and visual aid media such as films and film strips are contemplated as well as publication of annual revisions of a directory of air pollution control officials, a register of air analyses, and a listing of research projects and findings.

WATER SUPPLY AND WATER POLLUTION RESEARCH PROGRAM

I. PROGRAM OBJECTIVES AND OVER-ALL PROBLEMS

The need for protection of our national water resource, already urgent, is increasing. With a constant or perhaps even a diminishing total resource, we have a steadily increasing demand on that resource. All the major uses of water share in this demand increase - industrial, municipal, recreational, and agricultural. More than ever there is need to develop practical procedures for conserving water now lost through uncontrolled run-off and evaporation, for reclaiming polluted waters whose quality has been spoiled for many important water uses, and for preventing pollution in the future. As one of the Federal agencies concerned with our water resource, the Public Health Service has important functions in conserving and safeguarding our surface and ground water supplies.

Public Law 660, the Water Pollution Control Act Amendments of 1956, gives the Public Health Service responsibility for developing and conducting the Federal program in water pollution control covering all important municipal, industrial, agricultural, and recreational water uses. For the first time, research is authorized in all phases of prevention and control of pollution by municipal and industrial wastes. The conduct of this research program and the provision of technical assistance to other Federal agencies, State and interstate agencies, municipalities, industry, and others represent primary tasks of the Robert A. Taft Sanitary Engineering Center.

II. RESEARCH PLANS

The major current research areas and those proposed for initiation and expansion in the next few years are described below.

A. Industrial Wastes

1. Synthetic Organic Chemicals. Ways are needed to estimate the degree of treatment a specific industrial waste requires to protect downstream water uses. Research is underway to (a) develop a set of procedures for obtaining information on the pollutional characteristics of certain synthetic organic chemical wastes and (b) determine whether a relationship exists between these characteristics and chemical structure and physical constants. If groupings may be established on this basis the pollutional character of a new waste may be predicted from its classification.

2. Identification of Wastes. Better procedures are needed for prompt identification and tracing of industrial organic components that impair downstream water uses. The research program seeks to work

out faster, more precise, and inexpensive methods for recovery, concentration, identification, and evaluation of specific industrial waste components.

3. Treatment of Synthetic Organic Chemicals. Conventional biological treatment, originally designed to stabilize sewage and sewage-like solids, does not work well for many synthetic organic chemicals. More knowledge of the kinds, requirements, and control of organisms useful in synthetic organic chemical destruction will promote the science of waste treatment. Part of the research at this Center is to explore fundamental mechanisms of selection and adaptation of bacterial, fungal, and algal species and to develop effective techniques for utilization of organisms capable of the metabolism of synthetic organic chemicals.

4. Stream Self-Purification. Present formulations for predicting the self-purification rate of streams are reliable only for sewage and sewage-like materials. Further studies are needed to develop and improve procedures for reliable prediction of the capacity of a stream to assimilate synthetic organic chemicals. Work will continue to identify fundamental physical, chemical, and biological agencies involved in stream self-purification and to develop improved procedures for predicting and measuring it.

5. Sewage Treatment Interference. Many industrial waste components, particularly heavy metals, impair biological processes at the sewage treatment plant. Studies are underway to identify industrial waste components disrupting biological sewage treatment processes, to develop sensitive analytical procedures for detecting and measuring these materials, to investigate outstanding problems in the laboratory and in the field, and to establish maximum tolerable levels for specific industrial waste components.

B. Sewage Treatment

Reduction of the high cost of sewage treatment, particularly for small communities, requires development of more efficient and cheaper treatment techniques requiring less attention for operation and maintenance. Special efforts are being directed separately to the needs of the large city, the small community in the metropolitan area, and the small isolated community. Research is aimed at improvement of methods for obtaining intensive bio-oxidation of sewage solids, including use of novel oxidative surfaces arranged in unconventional manner and the development of more efficient ways of satisfying oxygen requirements.

C. Water Supply

1. Conservation and Reuse. In more and more places water demands are outgrowing supplies because of population, industrial, and agricultural growth. The situation will become more acute in the near future. The President's Advisory Board on Water Resources has predicted that the national daily consumption, now approximately 185 billion gallons per day, will reach 350 billion gallons a day by 1975. It is essential, therefore, that water use practices be analyzed carefully to determine how waters now being lost or wasted may be conserved for use and reuse.

Major water losses occur by evaporation, failure to capture and store flood waters, and failure to reclaim the water component of liquid wastes. In the Southwest, loss from water evaporation exceeds water use. Moreover, evaporation reduces water quality and increases treatment costs by concentrating dissolved and suspended solids. The water component of water-carried wastes, approximately 99% of the total wastes, represents a gross wastage of water. In many areas of the U.S., the future adequacy of local water supplies will depend on the availability of effective methods for separating the suspended and dissolved solids from this water.

Major research efforts will be directed to developing methods for reservoir evaporation reduction, as by use of thin films of alcohols, to finding practical ways of using natural underground reservoirs; and to developing better ways of treating waters to permit maximum use and reuse.

2. Economical Water Treatment. Many improvements in chemical coagulation, filtration, disinfection, and automation have been applied to water treatment practice, but design criteria have not kept pace. Effective advantage has not been taken of these improvements to reduce cost of treatment. To improve this situation, new design and operating standards will be analyzed and compared for safety and cost with conventional treatment methods. Waters used in these evaluations will be contaminated with microorganisms and chemicals that realistically represent the most challenging demands that may be placed on the treatment processes. Recommendations for future criteria will be established.

3. Microorganisms in Drinking Water. Interest is keen in the possibility that virus disease may spread through drinking water. This interest has disclosed the inadequacy of present techniques of working with viruses in water, particularly with the virus of infectious hepatitis. Interest is also growing in the sanitary significance of nonintestinal bacteria, protozoa, nematodes, and other biota reported with increasing frequency in water distribution

systems. Methods will be developed, evaluated and recommended for recovery, culture and count of organisms found in water distribution systems but not usually associated with water supplies. Recommendations will be made on tolerable concentrations of such organisms in water supplies and on control procedures.

III. CONTRACT RESEARCH

Examples of proposed contract research include the following:

1. Design and construction of equipment for large scale extraction and concentrations of organic chemical waste components for characterization of pollutional effects.

2. Engineering of a chemical oxygen demand analyzer based on the SEC design to provide as soon as possible an automatic device for quick measurement of this valuable parameter of total organics in the stream.

3. Precise studies on dissolved oxygen saturation levels in saline waters to make possible more reliable predictions of waste assimilation capacity of tidal waters.

4. Development and evaluation of sensitive analytical procedures for identification and measurement of selected heavy metals which damage sewage treatment processes and are toxic to fish.

5. Determination of biochemical reactions of organics in dilute solution so that (a) chemicals recovered at points of water use may be traced to parent pollutants, (b) the products of organics decomposition may be predicted.

6. Studies on nutrient requirements of slime growths associated with pollution to permit relation of profuse growths to pollution components.

IV. TECHNICAL SERVICES

Response to requests for technical services represents an essential activity of the Water Supply and Water Pollution Research Program. Requests for such aid are received from Public Health Service units, other Federal agencies, State and interstate agencies, municipalities and other State subdivisions, industry, universities,

professional organizations and individuals. The problems on which assistance is desired cover every important aspect of the water environment. The work effort required for these requests varies from simple correspondence, based on literature search, to extended field studies involving teams of specialists and mobile laboratories. Very often this response requires laboratory research support. Many problems on which technical assistance has been requested are of very great regional significance. Examples of proposed projects falling in this category are the following:

1. Collection, treatment and disposal of oil field brines (in the Southwest).

2. Prevention and control of acid mine drainage (in Central and Central Atlantic States).

3. Conservation of water lost by evaporation in specific impoundments (in the Southwest).

4. Determination of factors affecting waste disposal in tidal waters.

5. Epidemiological evaluation of use of highly contaminated water for irrigation of vegetables consumed raw.

6. Study of pollutional trends affecting the Great Lakes water resource.

MILK AND FOOD RESEARCH PROGRAM

I. OVER-ALL PROBLEM AND PROGRAM OBJECTIVES

Research in milk and food sanitation seeks to prevent foodborne diseases by investigating the causative agents, the sources and means of contamination, indicators of unsanitary conditions, and practical ways of minimizing the health hazards associated with consumption of milk, shellfish, poultry, and other foods. Authority for these research activities is based on the general provisions of the "Public Health Service Act" of 1944, as amended. The applicable sections, mainly 301 and possibly 361, are rather vague with respect to milk and food, and more explicit legislation would be helpful in defining the role of the Service and establishing a firm basis for meeting the recognized needs.

The effectiveness of past efforts to improve sanitation is reflected by the fact that food reaching the consumer in the United States today is safer than in almost any other part of the world. Nevertheless, progress here has not kept pace with other fields of public health. The States continue to report, almost daily, foodborne disease outbreaks, roughly half of which are of undetermined etiology. The number and size of reported outbreaks increased by 10 per cent or more each year from 1952 through 1954. By comparison with the reported incidence of waterborne diseases, the illnesses attributed to contaminated foods are disproportionately large. For example, of 657 such outbreaks reported from 1953 through 1955, only 20 were waterborne, and they accounted for only 1,193 of more than 33,000 cases involved.

The heavy demand for new and unavailable technical information on food sanitation, being received not only by Sanitary Engineering Center but even more frequently by Division of Sanitary Engineering Services and the Regional Offices, denotes the lack of an adequate national research program to cope with the revolutionary changes in industrial practices and consumer habits.

The following examples of trends in the food field indicate the variety of important public health problems on which state and local agencies need assistance:

1. Commercial processing and wide distribution of prepared non-sterile foods that are essentially ready to eat as marketed. These include bakery goods, precooked frozen foods, and so-called delicatessen items.

2. Increased consumption of food outside the home from such sources as commercial eating establishments, industrial catering services, school lunch programs, vending machines, and roadside facilities serving the tourist trade.

3. Exposure of foods to foreign chemicals, including a host of additives, as well as residues of insecticides, rodenticides, germicides, antibiotics, and other inhibitors.

4. Use of new packaging materials and procedures such as plastic containers or wrappers, enameled cans, and treated papers.

5. Tendency to heat food at higher temperatures for shorter times as is done in HTST pasteurization of milk, aseptic canning, or baking by infrared and microwave techniques.

6. Irradiation of foods with high-energy sources to produce partial or complete destruction of microorganisms.

7. Preservation by new dehydration techniques such as drying from the frozen state.

The technical questions on sanitation raised by any one of the above trends could profitably occupy the continuing attention of a research organization larger than the 22 persons presently employed by SEC to investigate all types of milk and food problems.

In considering the future plans of milk and food research, it should be recognized that the ultimate goal is to provide a scientific staff having the competence and resources to participate in and exert leadership in all phases of a national program of milk and food sanitation. To attain this goal SEC will eventually need a new food research facility and an order of magnitude increase in the annual operating budget for the program.

II. CURRENT STATUS OF PROGRAM

All work in Milk and Food can be classified as milk, food, or shellfish sanitation research and technical services. Research problems have been selected on the basis of need and on the competencies available within the present group.

A. Food Sanitation Research

The recognition and elimination of harmful food contaminants constitute the most direct approach to the prevention of foodborne disease, which is one of the primary objectives of this program. A considerable portion of the resources of the program are being directed to this end.

Techniques are being developed for the rapid detection of staphylococci in a variety of foods. The basic methodology for this technique has been completed, and current activities are concerned with an evaluation of the general applicability of this method. Studies are also underway to develop a quantitative bioassay for staphylococcal enterotoxin. Emphasis is being placed on studies with food products such as dry milk in which the toxigenic organisms have been destroyed during processing and conventional methods for the detection of staphylococcal contamination are not applicable.

In order to provide public health officials with objective criteria for the evaluation of food sanitary practices, a comparative survey of methods for recovery of microorganisms from food equipment surfaces has been undertaken. These continuing studies are serving as a baseline for the development of more accurate and/or convenient methods.

B. Milk Sanitation Research

The trend in the dairy industry toward high pasteurization temperatures, more rapid heating, and shorter holding time poses some serious public health problems. Because of the conflicting evidence concerning the destruction of the more heat-resistant milkborne pathogens by these newer methods, studies are needed to develop a basis for more completely defining the pasteurization process and for establishing sound regulations governing the operation of this equipment. Present work in this area at SEC is limited to studies of measurement of flow times of milk and water in closed systems such as found in HTST pasteurization equipment. Improved methodology for accurate measurements of flow time is being developed, including a tracer technique using radioisotopes.

In support of the Interstate Milk Shipment Control Program, experimental shipping containers, insulating materials, and refrigerants for air transport of split milk samples are being fabricated or selected and tested. By employing the best shipment design to date, bacterial counts of milk samples will remain essentially constant for three days at an ambient temperature of over 90°F, and the entire container including refrigerant will weigh less than 20 pounds.

C. Shellfish Sanitation Research

Shellfish sanitation research is performed both at Cincinnati and in a field station located near Pensacola, Florida. The Pensacola group are investigating the influence of the aquatic environment and commercial practices on sanitary quality of oysters. The present studies concern a determination of a number of enteric bacteria in oysters taken from commercial growing areas in which the overlying waters vary greatly in sanitary quality. Traced lots of oysters from these areas are being examined at each stage of commercial processing from harvesting through packing. As a result of these studies, a tentative market standard for oysters has been developed quite recently.

Shellfish research at Cincinnati has been related to the quantitative assay of paralytic shellfish poison in clams and mussels. The conventional method used to assay this material is a mouse bioassay. In recent months this method has been carefully evaluated and standardized, and through the cooperation of the Army Chemical Corps the Public Health Service has available a purified reference standard for distribution to laboratories which routinely engage in this work.

In addition to the bioassay, a laboratory procedure for the quantitative chemical assay of paralytic shellfish poison has been developed utilizing chromatographic separation of the poison from the clams and subsequent measurement of the concentration by a colorimetric method (Jaffe Test). This investigation is virtually completed, and the results will be published in the near future.

D. Technical Services

A fundamental principle of the Center's milk and food activities is that results of experimental studies and information from other sources shall be utilized to render technical services to State and local public health officials, interested citizens, industrial organizations and so on. Accordingly, responses to requests for review of technical data, evaluation of laboratory practices, revision of technical portions of codes and ordinances, solutions to food sanitation problems, and for a variety of other types of assistance represent a substantial portion of the effort of the senior staff.

In addition to general technical assistance, an extensive contribution is made to the sanitation control activity of the Milk and Food Program, Washington, D. C. As part of the voluntary Interstate Milk Shipment Program SEC assumes the responsibility of spot checking State laboratories for their compliance with standard methods in the examination of dairy products in order to assure uniform standards of milk quality throughout the nation. In the Shellfish Sanitation Control Program SEC distributes and services a paralytic shellfish poison reference standard. This standard is made available to shellfish control laboratories for standardization of the mouse bioassay for paralytic shellfish poison which is the primary tool in the control of toxic shellfish.

III. PLANS FOR FY 1958 AND 1959

No major increases in research activity are anticipated during Fiscal Year 1958 under established ceilings on the operation of this program. There will be, however, some program changes resulting from the completion of certain of the problems currently under investigation. It is anticipated that the rapid presumptive method for the detection of staphylococci in foods will be completed, and a similar project will be initiated for development of a method for rapid detection of enteric bacteria. The chemical assay for paralytic shellfish poison should also be finished, and the resources currently devoted to this project will be directed primarily to increasing the research concerned with the detection and control of staphylococcal enterotoxin. Also, preliminary work will be initiated to investigate the influence of radiation-induced changes in food on the growth rate of toxigenic and infectious organisms.

In FY 1959 it is proposed to accelerate the research program to meet some of the more critical needs in the field of milk and food sanitation. Expansion of research will be limited to an increment of growth which can be absorbed efficiently. This will permit study of no more than half of the problems mentioned in the first part of this report. The major areas to be investigated during FY 1959 are listed below:

A. Food Sanitation Research

1. Evaluation of rapid methods for detection of enteric pathogens by field trials.

2. Development of techniques for the assay of staphylococcal enterotoxin in foods.

3. Completion of studies on recovery of microorganisms from surfaces of contaminated equipment, utensils and food products.

4. Investigation of selected chemical tests as indicators of unsanitary foods.

5. Study of critical time-temperature relationships related to the preparation and holding of perishable foods, and recommendation of safe practices for handling them commercially.

6. Determination of the sanitation requirements of radiation processed foods.

B. Milk Sanitation Research

1. Establishment of basic criteria for evaluating new methods of pasteurizing milk and milk products, especially by high-temperature short-time processes operating in the range from 160° to 200°F.

2. Development of a sensitive method for measuring flow patterns in dairy equipment.

3. Investigation of bacterial simulants and pathogens for determining the margin of safety provided by thermal treatments applied to dairy products.

4. Study of the utility of selected chemicals, such as hydrogen peroxide, for destruction of pathogens in milk products in lieu of pasteurization and subsequent preservation in the absence of refrigeration.

5. Determination of the validity of selected methods for evaluating chemical germicides and their applicability to new types of sanitizing agents for milk and food equipment.

C. Shellfish Sanitation Research

1. Transfer of the Shellfish Sanitation Laboratory from the Gulf Coast to the Pacific Coast.

2. Initiation of laboratory and field studies on sanitation problems typical of western shellfish producing areas, where environmental conditions, species of shellfish, and industrial practices differ notably from those of the Atlantic and Gulf Coasts.

3. Continue research on market standards for shellfish and other cooperative studies with producing States.

4. Accumulate information on the practical application of the standardized bioassay and the chemical test for shellfish poison by control laboratories.

5. Distribution of the reference standard will continue but other work on shellfish poison will be de-emphasized or terminated.

D. Poultry Sanitation Research

Poultry sanitation research will be initiated to study the microbiological and chemical changes associated with commercial processing of poultry. By the end of FY 1959 an assessment of pertinent literature will be completed, selected microbiological and chemical procedures will have been evaluated and a field study of commercial processing practices will have been initiated.

About a third of the proposed increase in activity will be devoted to field investigations especially in the fields of poultry and shellfish sanitation.

RADIOLOGICAL HEALTH RESEARCH PROGRAM

I. OVERALL PROBLEM AND PROGRAM OBJECTIVES

By the end of 1961, two hundred nuclear reactors will have been built in 23 States, the District of Columbia, and Alaska. In addition, specific military package-type reactors and other installations operated by the Atomic Energy Commission are located in many States. All these nuclear energy facilities introduce the problem of control of radioactive pollution to almost every State health department and water pollution control agency. If not directly engaged in the control of radioactive contaminants from industrial operations, each State will have an active interest in the effect of fallout, rainout, or other radioactive debris on background levels within its jurisdiction.

The overall program objectives are to carry out research on the sources, extent, behavior, effects, and control of radioactive pollution in the total environment and to encourage and collaborate with Federal, State, community, and other organizations in related activities. These include:

1. The expansion of national networks to provide a continuous reliable assembly of information on radioactivity levels in water, air, biological materials, soils, and foods (particularly milk).

2. The development of suitable techniques for the measurement of gross alpha, beta, and gamma levels in each of the media indicated, and for the identification and measurement of specific radionuclide activity.

3. The use of radiation, radioactive materials and activation techniques as aids to chemical, biological, and sanitary analysis.

4. The assignment of competent personnel to AEC and other atomic energy installations to carry out cooperative research programs relating to the handling, treatment and disposal of radioactive wastes.

5. The furnishing of technical guidance and consultation to states and communities for the establishment and operation of radiological health programs.

II. PRESENT PROGRAM ACTIVITIES

The air samples collected for the National Air Sampling Network and the samples collected at Cincinnati for the National Radiation Surveillance Network have been counted for total beta-gamma activity. Recently some measurements have been made of the radon and thoron activities in Cincinnati air. These indicate that the natural activity is 200 to

26,000 times the activity contributed by fallout.

During the last four years, rainfall has been collected and gross beta-gamma activity associated with filterable particulates and filtrate (soluble fraction) has been determined. Considerable variation in activity levels, corresponding to nuclear test operations, has been found. These data are of particular interest in that rainfall is the source of cistern water supplies with many such installations found in the Cincinnati area (several recent housing developments are entirely dependent upon rainfall or on tank truck delivery of water). Data collected during 1953-1956 show that the recommended MPC value of 10^{-7} uc/ml (100 uuc/l) for mixed isotopes in water has been exceeded quite frequently and that the proposed level of 10^{-8} uc/ml (10 uuc/l) has been exceeded almost continuously. Actual tap water levels from cisterns have shown activity levels varying from 73 to 202 uuc/l.

Analytical methods have been completed for the low-level identification in water of radium, strontium, barium, and cesium. This fiscal year should see methods for zirconium, niobium, iodine, yttrium, and ruthenium provided. Instrumentation is being developed to permit direct gamma counting.

Radiotracer techniques are being used to measure the holding time in pasteurization equipment, and for defining the rate of flow and the dispersion of pollutants in surface streams.

III. FUTURE PLANS

A. National Radiation Monitoring Netowrks

To provide a continuous reliable assembly of information on the radioactivity levels in water, air, biological materials, soils, and foods (particularly milk), an expanded program of sample collection, analysis, evaluation, and interpretation will be operated to determine gross alpha and beta-gamma contamination. Such networks will encompass the following activities:

1. An air sampling network providing adequate coverage of the U.S. and territories for the measurement of gross beta contamination (bomb debris).

2. Mobile sampling teams to measure the short-lived alpha, beta and gamma radiation of air particulates at strategic populated areas in the U.S. where the geological formations are moderately rich in uranium and thorium elements. The investigation to include the role played by man-made air pollution on enhancing lung exposure from the natural radioactivity of radon and thoron daughter products.

3. A network of rain collection and analyses to determine the levels of radioactivity and relate these values to

activity levels found in streams and private water supplies. Should not the Public Health Service answer the question, "How much activity is contributed by rainfall to private and public water supplies?", as well as define the role of the environment in reducing levels of activity from source (rainfall) to ultimate consumer?

4. A water quality network to collect samples from (a) streams which are sources of water supplies, and (b)the environs of proposed atomic reactor sites or other AEC operations.

5. A national network of food sampling, with emphasis on analysis of milk, will be expanded to keep abreast of the changing pattern of radio-strontium and other important radioisotopes in food. The permissible levels of Sr-90 in food consumed by infants should be reviewed and modified as necessary.

B. Radiochemical and Instrumental Assay

Measurement of total activity as such tells only part of the story; it is necessary to determine the pertinent individual radionuclides contributing to the total activity in order to make a critical and significant appraisal of the exposure levels encountered. Analyses for the most dangerous isotopes -- such as radium, plutonium, strontium and cesium -- will be made on all types of samples including air, water, soil, food, and other biological materials. These analyses will provide data on the role of the environment in changing the composition as well as the levels of activity. Marked reduction in activity, however, is not always associated with a marked reduction in hazard or internal exposure; the latter being a function of radionuclides composition.

In order to determine the amounts of the more important radionuclides, present methods of analysis, both chemical and instrumental, must be improved and modified so as to be applicable to samples of different kinds. Where available instrumentation is inadequate for the identification of the activity levels, it will be modified or new instrumentation developed to meet specific needs.

C. Tracer Applications

Specific studies will be undertaken in the use of radiation, radioactive materials and activation techniques as aids to chemical and biological analysis, in measurement of the time and distribution of flow, in defining the processes taking place in water and sewage treatment, and in evaluation of the efficiency of specific processes now being used to define environmental parameters of interest.

D. Radioactive Waste Disposal

The Oak Ridge Operation will be expanded and similar programs established at other AEC sites to carry out cooperative research programs in radioactive waste disposal. The nature and characteristics of the wastes will be determined and the methods proposed for handling, treatment, and disposal analyzed to evaluate the public health aspects of such operations as well as their ultimate effects on the environment. The areas to be considered involve the effect of the wastes produced on the overall ecology of the region: streams, ground water, soil, vegetation, animal life, and atmosphere.

In the special case of uranium mill processing wastes, these activities are coordinated with the Water Supply and Water Pollution Control Program. The problems here are the effect of the release of radium-226 (the most harmful alpha emitting radioisotope in water) into the environment, and the effect of the use of tailings as fill materials.

TRAINING PROGRAM

I. OVERALL PROBLEM AND PROGRAM OBJECTIVES

Specialized technical training courses shorten the gap between the acquisition of new knowledge and its effective application. The expanding need for training professional personnel in the sanitary engineering field is related to the greatly expanding research effort directed towards the solution of complex problems of our environment, and to the growth and development of control programs in the States with the added impetus of the new air and water legislation.

Effective communication between the research workers and the practitioners in the sanitary engineering field becomes more important as technological development continues to accelerate. The highly specialized research workers and the journals in which their research is published often fail to reach the men who require the new information. Further, the benefits of productive research may be realized only after much time-lag unless the information, methods, techniques, procedures, and interpretations are made available promptly to the practicing public health worker.

Both old and new laboratory methods must be constantly and critically evaluated to insure their maximum effectiveness. The Analytical Reference Service of the SEC offers a ready mechanism for attaining this objective.

II. SPECIFIC OBJECTIVES OF THE SEC TRAINING PROGRAM

1. To plan, develop, conduct, and administer specialized training courses and seminars for practicing professional public health personnel in the fields of Community Air Pollution, Milk and Food Sanitation, Radiological Health, and Water Supply and Water Pollution. Full advantage is taken of the large technical staff and the laboratory facilities of the Center in courses designed for presentation at the Center.

2. In cooperation with the States, to develop and present courses in the States so that greater numbers of workers may participate in this training.

3. To stimulate the needed organization and expansion of State training programs by providing consultation and special assistance in developing and carrying out such programs.

4. To develop authoritative training aids, syllabi, manuals, slides, film strips, and demonstration materials for the special courses given at the Center and in the States.

5. To provide technical consultative services to field, State, and local agencies, covering primarily sanitary engineering laboratory practices.

6. To provide an Analytical Reference Service as a training tool to assist the States in their laboratory programs by evaluating new and old analytical methods; evaluating analytical results obtained by State and Federal agencies; aiding the States in organizing and conducting similar reference programs within their jurisdictions; revealing areas of need for research on analytical methods; encouraging adoption of new and improved analytical methods; and serving as a focal point in the resolution of problems of analytical methods as well as of instrumentation, instrument evaluation, and the automation of laboratory procedures.

7. To provide consultative services to foreign public health agencies desiring to institute specialized programs of training in the field of sanitary engineering, and to determine training needs and to arrange individual training programs for official foreign visitors.

8. To provide training programs for special groups such as scientists and engineers from foreign countries visiting the Center under arrangements made with official agencies. Sanitary Engineer Reserve Officers from the Army, Navy, Air Force, and Public Health Service also receive special training here under joint agreement with the respective Services and the Department of Defense.

III. TRAINING COURSES PLANNED

Air Pollution

Courses in air pollution include atmosphere and source sampling, sample analysis, control methods, and the administration of air pollution control programs. In addition, a limited presentation of these as field courses will be made in the States.

From year to year these courses will be modified in the light of new research developments. The field training effort will be amplified to embrace a greater number of presentations in the States. Additional specialized courses and seminars will be developed on the use and application of new equipment and techniques. A growing and heavy demand can already be forseen for courses in air pollution meteorology and air pollution effects on vegetation.

Milk and Food

Work plans for FY 1958 contemplate limited presentation of technical training courses in three major areas: (1) laboratory control methods for milk and dairy products, (2) food microbiology and sanitation, and (3) shellfish sanitation.

In contrast to the other program areas there is no training item in the Milk and Food Program for FY 1959. This deficiency should be remedied in this field. With such provision in FY 1959 it is proposed that courses in the three mentioned areas will be fully developed and offered on a less limited basis. In addition courses are needed in the areas of (4) radiation sterilization of foods; (5) methods of cleansing and sanitizing milk and food processing, dispensing, and vending equipment; and (6) methods of detecting microbic inhibitors in milk and foods other than milk. Field courses are also in demand and are contemplated.

Radiological Health

By 1960 an appreciable number of power reactors and related nuclear energy installations for peacetime uses will have become a reality. The general aim of the radiological health training program is to equip public health staffs to meet the responsibility that will result from these developments. Aid to universities in the development and presentation of their courses covering the public health aspect of nuclear energy is also being provided.

During FY 1958, in addition to the existing course offerings, a new course dealing with the broad sanitary engineering aspects of nuclear energy will be presented in Cincinnati. This course will include the air, water, waste disposal, and food sterilization problems, as well as beneficial applications of nuclear energy such as tracer techniques in stream and industrial waste surveys and radiochemical techniques in the sanitary engineering laboratory.

In FY 1959 radiological health training will expand to include a number of specialized topical courses that have been developed from the general sanitary engineering aspects of nuclear energy course. Example of these course offerings are water monitoring, radioactive waste treatment and disposal, air monitoring and food sterilization which will be developed and presented.

Water Supply and
Water Pollution

With the development of new industrial technology, population growth, and urbanization trends, the technical problems related to water use are expanding rapidly. The declared Federal policy of recognizing, preserving, and protecting the primary responsibilities and rights of the States in preventing and controlling water pollution underlines the need for a high degree of technical competence in the State agencies concerned.

As State pollution control activities are intensified under the various programs embraced in PL 660, interstate agreements, and new State legislation, the number of practicing personnel in the field of water supply, sewage treatment, and industrial waste control will increase. There is a clear and growing need for the SEC to expand its training effort in bringing together significant new research findings, integrating this information in a meaningful way, and presenting it to the men who are directly responsible for securing the best use of water resources. Every increase in our overall national effort in water resources is reflected in an increased demand for the specialized training the SEC provides.

In FY 1959 a broad offering of specialized training courses covering important aspects of water supply, sewage treatment and industrial wastes will be presented. These courses will emphasize the most recent research developments in the chemical, aquatic biological, microbiological, and engineering phases. Plans are directed especially also toward meeting a great need for field courses conducted in the states.

Civil Defense

The principal objective of Civil Defense Training at SEC is to train State and local public health personnel to perform tasks required of them in either natural disaster or the threat or use of nuclear, biological or chemical weapons in manmade disaster. A general orientation course, "Public Health in Civil Defense", is initially presented to key State public health personnel. Other courses are then presented to their staffs concerning the sanitation aspects of civil defense disaster.

A general course, "Sanitary Engineering Practices in Civil Defense Disaster" provides training in emergency sanitation practices for water, milk and food, wastes, etc. A specialized course, "Civil Defense for Waterworks Personnel", concerns problems of emergency water supply protection and purification. Another, "Civil Defense for Public Health Sanitation Laboratory Personnel", pertains to emergency detection, identification, and decontamination of chemical, biological, radiological contaminants.

A course, "Field Laboratory Operations Under Disaster Conditions", is to be developed to provide field-type training, under simulated disaster conditions, in assessing hazards associated with special weapons, particularly those of chemical warfare, and in the employment of emergency sanitation measures. Later a laboratory course will be developed for personnel having peacetime responsibilities in radiation measurement and assay of the potential long-term hazard resulting from fallout contamination of water, milk, and food. A water-supply course will be developed with emphasis on field training in the development of emergency supplies.

EPIDEMIOLOGY, TOXICOLOGY, AND BIOSTATISTICS

I. OVER-ALL PROBLEM AND PROGRAM OBJECTIVES

Research endeavors in environmental sanitation offer the sanitary engineer promising challenges which require the collaborative efforts of the epidemiologist, toxicologist, and biostatistician. Among problems requiring a multiple disciplinary approach are various projects of the Water Supply and Water Pollution, and the Milk and Food Sanitation programs. The epidemiologic and health survey activities at this Center are limited at present to these by administrative directive.

In the first year of epidemiological activities, efforts relating to this Center's work have been directed to outlining projects which would assess any human health effects from exposure to residual chemical substances or microbiological end-products contained in drinking waters and food substances. As resources become available active participation in such projects will be undertaken.

II. WORK IN PROGRESS

Current activities are financed largely by other Public Health Service units and relate to completion of investigations begun earlier in a broader field of environmental health. They are outlined below:

1. Mortality Review. Mortality records from the City of Cincinnati, 1949-1954, are being analyzed in search of associations between specific causes of death and (a) occupation, (b) industry of employment, and (c) census tract of residence, an index of socioeconomic status. This represents simply a lead-seeking study from which conclusions of causal relationship will not be possible. Follow-up studies will be pursued in accordance with promising leads.

2. Neurotropic Virus Studies. Cross-sectional studies of certain neurotropic virus diseases, in progress since 1952, are being continued. They relate to sanitational and other environmental factors, both endogenous and exogenous, as they affect incidence and clinical forms of disease. Among these projects are investigations

of provocative and permissive factors of poliomyelitis, St. Louis encephalitis, and the postinfection encephalomyelitides.

3. Orphanage Studies. Longitudinal studies in a Cincinnati orphanage designed to detect virus etiologies of acute communicable diseases are in progress as a collaborative venture with scientists at the National Institute of Allergy and Infectious Diseases. These studies utilize morbidity data collected by daily diaries and specimens obtained at biweekly intervals by oropharyngeal and rectal swab culturing techniques.

III. PROPOSED RESEARCH PLANS

The following projects in the areas of responsibility, which deal with activities assigned to this Center, are proposed for initiation as soon as resources become available.

1. Toxicity of Waterborne Chemicals. Synthetic organic chemicals in the form of industrial wastes, as well as materials purposefully added to water supplies, such as polyelectrolyte coagulants, are steadily becoming more concentrated in "potable" waters. Any health impediment they impose requires quantitative and qualitative assessments.

Since few established medical facts suggest a reasonable probability of causal association between consumption of public waters and human disease, a lead-seeking approach would start with studies of death records. Populations consuming differing waters would be compared with respect to specific causes of death, making due adjustments for all variables (demographic, temporal, occupational, etc.) entered on mortality records. Subsequent studies in the follow-up of leads would include (a) cross-sectional studies of living individuals with and without specific diseases, and (b) longitudinal studies in selected population groups, both approaches searching for differences between groups in the form of environmental characteristics.

Toxic effects in experimental animals resulting from consumption of water containing present and projected

concentrations of known chemical contaminants are measurable in the laboratory. Data on acute, subacute, and chronic effects are needed to determine tolerance levels and maximum allowable concentrations. Range-findings, both qualitative and quantitative, to determine "no", "slight", and "detrimental" effects are essential if our technological studies are to have public health significance.

2. Toxicity of Foodborne Chemicals. Any long-term health effects resulting from exposure to subclinical doses of biological toxins and a wide variety of chemical substances added either intentionally or inadvertently to foodstuffs deserves study. It has been proposed that toxicologic studies patterned after those outlined in Problem (1) be undertaken.

3. Staphylococcus Enterotoxin Dosage. Food poisoning from ingestion of staphylococcal enterotoxin is a well established entity, yet minimal disease producing dosages are unknown. Studies under way at the Center are designed to develop a specific and sensitive bioassay test for detection of this toxin. It has been proposed that human tolerance and minimal disease producing dosage levels be established by epidemiologic study in human volunteers after suitable bioassay tests have been developed.

4. Agricultural Irrigation. Use of irrigation waters containing high concentrations of raw sewage is accepted agricultural practice in certain areas of this country. Not unexpectedly, these waters, and truck crops bathed by them, have been shown to harbor the causative agents of specific bacterial and parasitic diseases. Unanswered and thus far inadequately studied is the question of vegetables so irrigated acting as vehicles of infection.

It has been proposed that epidemiologic study of the potential mechanism of disease spread be investigated by comparison of disease and infection rates in selected human populations containing consumers and nonconsumers of such polluted vegetables.

5. Methemoglobinemia. Acquired methemoglobinemia in newborns and young infants has been associated with feeding of artificial formulae made with certain private

well waters containing high concentrations of nitrates. However, high nitrate content waters are more widely distributed over sections of the United States than reported cases of the disease. Answers to this somewhat unexpected finding and other problems are needed before sound preventive measures can be advocated.

It has been proposed that epidemiologic study of methemoglobinemia cases coupled with appropriate biochemical and microbiologic analyses of waters be made to determine: etiologies, incidence, and control methods of the disease.

6. Sodium and Hypertension. Evidence accumulates to suggest association between high sodium chloride intake and hypertension in humans. It has been proposed that ingested sodium is permissive or provocative of the development of essential hypertension. Also, it is well established that sodium concentrations of public drinking waters vary widely in different sections of the country, and that sodium contents are especially high in waters "softened" by zeolite processes.

It has been proposed that ecological correlation be made relating variations in sodium content of public drinking waters to variation in age- and race-adjusted death rates from hypertensive heart disease and congestive heart failure in selected cities of the United States. In the event of positive association, quantitative studies should be extended in living populations.

Title III--General Powers and Duties of Public Health Service

PART A -- RESEARCH AND INVESTIGATIONS

In General

Sec. 301. The Surgeon General shall conduct in the Service, and encourage, cooperate with, and render assistance to other appropriate public authorities, scientific institutions, and scientists in the conduct of, and promote the coordination of, research, investigations, experiments, demonstrations, and studies relating to the causes, diagnosis, treatment, control, and prevention of physical and mental diseases and impairments of man, including water purification, sewage treatment, and pollution of lakes and streams. In carrying out the foregoing the Surgeon General is authorized to--

(a) Collect and make available through publications and other appropriate means, information as to, and the practical application of, such research and other activities;

(b) Make available research facilities of the Service to appropriate public authorities, and to health officials and scientists engaged in special study;

(c) Establish and maintain research fellowships in the Service with such stipends and allowances, including traveling and subsistence expenses, as he may deem necessary to procure the assistance of the most brilliant and promising research fellows from the United States and abroad;

(d) Make grants-in-aid to universities, hospitals, laboratories, and other public or private institutions, and to individuals for such research projects as are recommended by the National Advisory Health Council, or, with respect to cancer, recommended by the National Advisory Cancer Council, or, with respect to mental health, recommended by the National Advisory Mental Health Council, or, with respect to heart diseases, recommended by the National Advisory Heart Council, or, with respect to dental diseases and conditions, recommended by the National Advisory Dental Research Council, and include in the grants for any such project grants of penicillin and other antibiotic compounds for use in such project; 1/

(e) Secure from time to time and for such periods as he deems advisable, the assistance and advice of experts, scholars, and consultants from the United States or abroad;

(f) For purposes of study, admit and treat at institutions, hospitals, and stations of the Service, persons not otherwise eligible for such treatment; and

1/ Subsection (d) was amended by section 7(a) of the National Mental Health Act, and further amended by section 4(e) of the National Heart Act, by section 4(e) of the National Dental Research Act, and by section 1 of PL 781, 80th Congress.

Sec. 301 (Cont'd)

(g) Adopt, upon recommendation of the National Advisory Health Council or, with respect to cancer, upon recommendation of the National Advisory Cancer Council, or, with respect to mental health, upon recommendation of the National Advisory Mental Health Council, or, with respect to heart diseases, upon recommendation of the National Advisory Heart Council, or, with respect to dental diseases and conditions, upon recommendations of the National Advisory Dental Research Council, such additional means as he deems necessary or appropriate to carry out the purposes of this section. 2/

2/ Subsection (g) was amended by section 7 (b) of the National Mental Health Act, and further amended by section 4(f) of the National Heart Act and section 4(f) of the National Dental Research Act.

Narcotics

Sec. 302. (a) In carrying out the purposes of section 301 with respect to narcotics, the studies and investigations shall include the use and misuse of narcotic drugs, the quantities of crude opium, coca leaves, and their salts, derivatives, and preparations, together with reserves thereof, necessary to supply the normal and emergency medicinal and scientific requirements of the United States. The results of studies and investigations of the quantities of crude opium, coca leaves, or other narcotic drugs, together with such reserves thereof, as are necessary to supply the normal and emergency medicinal and scientific requirements of the United States, shall be reported not later than the 1st day of September each year to the Secretary of the Treasury, to be used at his discretion in determining the amounts of crude opium and coca leaves to be imported under the Narcotic Drugs Import and Export Act, as amended.

(b) The Surgeon General shall cooperate with States for the purpose of aiding them to solve their narcotic drug problems and shall give authorized representatives of the States the benefit of his experience in the care, treatment, and rehabilitation of narcotic addicts to the end that each State may be encouraged to provide adequate facilities and methods for the care and treatment of its narcotic addicts.

Mental Health

Sec. 303. In carrying out the purposes of section 301 with respect to mental health, the Surgeon General is authorized--

(a) For purposes of study, to admit and treat at the National Institute of Mental Health, voluntary patients, whether or not otherwise eligible for such treatment by the Service, and patients of St. Elizabeth's Hospital transferred from the hospital pursuant to arrangements made between the Surgeon General and the Superintendent of the hospital with the approval of the Administrator: PROVIDED, That consent of a legal guardian shall be obtained before the transfer of any patient from St. Elizabeth's Hospital for such treatment.

(b) (1) To provide training and instruction, in matters relating to psychiatric disorders, to persons found by him to have proper qualifications, and to fix and pay to any of such persons as he may designate a per diem allowance during such training and instruction of not to exceed $10, the number of such persons receiving such training and instruction to be fixed by the National Advisory Mental Health Council; and (2) to provide such training and instruction, and demonstrations, through grants, upon recommendation of the National Advisory Mental Health Council, to public and other nonprofit institutions, but only to the extent necessary for the purposes of such training and instruction. 1/

1/ This section was added by section 7(c) of the National Mental Health Act.

PUBLIC LAW 159 - 84th CONGRESS

Chapter 360 - 1st Session

S. 928

AN ACT

All 69 Stat, 322.

To provide research and technical assistance relating to air pollution control.

BE IT ENACTED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED, That in recognition of the dangers to the public health and welfare, injury to agricultural crops and livestock, damage to and deterioration of property, and hazards to air and ground transportation, from air pollution, it is hereby declared to be the policy of Congress to preserve and protect the primary responsibilities and rights of the States and local governments in controlling air pollution, to support and aid technical research to devise and develop methods of abating such pollution, and to provide Federal technical services and financial aid to State and local government air pollution control agencies and other public or private agencies and institutions in the formulation and execution of their air pollution abatement research programs. To this end, the Secretary of Health, Education, and Welfare and the Surgeon General of the Public Health Service (under the supervision and direction of the Secretary of Health, Education, and Welfare) shall have the authority relating to air pollution control vested in them respectively by this Act.

Air Pollution Control

Authority

Sec. 2. (a) The Surgeon General is authorized, after careful investigation and in cooperation with other Federal agencies, with State and local government air pollution control agencies, with other public and private agencies and institutions, and with the industries involved, to prepare or recommend research programs for devising and developing methods for eliminating or reducing air pollution. For the purpose of this subsection the Surgeon General is authorized to make joint investigations with any such agencies or institutions.

(b) The Surgeon General may (1) encourage cooperative activities by State and local governments for the prevention and abatement of air pollution; (2) collect and disseminate information relating to air pollution and the prevention and abatement thereof; (3) conduct in the Public Health Service, and support and aid the conduct by State and local government air pollution control agencies, and other public and private agencies and institutions of, technical research to devise and develop methods of preventing and abating air pollution; and (4) make available to State and local government air pollution control agencies, other public and private agencies and institutions, and industries, the results of surveys, studies, investigations, research, and experiments relating to air pollution and the prevention and abatement thereof.

Sec. 3. The Surgeon General may, upon request of any State or local government air pollution control agency, conduct investigations and research and make surveys concerning any specific problem of air pollution confronting such State or local government air pollution control agency with a view to recommending a solution of such problem. Surveys upon local request.

Sec. 4. The Surgeon General shall prepare and publish from time to time reports of such surveys, studies, investigations, research, and experiments made under the authority of this Act as he may consider desirable, together with appropriate recommendations with regard to the control of air pollution. Reports.

Sec. 5. (a) There is hereby authorized to be appropriated to the Department of Health, Education, and Welfare for each of the five fiscal years during the period beginning July 1, 1955, and ending June 30, 1960, not to exceed $5,000,000 to enable it to carry out its functions under this Act and, in furtherance of the policy declared in the first section of this Act, to (1) make grants-in-aid to State and local government air pollution control agencies, and other public and private agencies and institutions, and to individuals, for research, training, and demonstration projects, and (2) enter into contracts with public and private agencies and institutions and individuals for research, training, and demonstration projects. Such grants-in-aid and contracts may be made without regard to sections 3648 and 3709 of the Revised Statutes. Sums appropria ted for such grants-in-aid and contracts shall remain available until expended, and shall be allotted by the Surgeon General in accordance with regulations prescribed by the Secretary of Health, Education, and Welfare. Appropriation. Grants-in-aid and contracts. 60 Stat. 809. 31 USC 529; 41 USC 5.

Sec. 6. When used in this Act-- Definitions

(a) The term "State air pollution control agency" means the State health authority, except that in the case of any State in which there is a single State agency other than the State health authority charged with responsibility for enforcing State laws relating to the abatement of air pollution, it means such other State agency;

(b) The term "local government air pollution control agency" means a city, county, or other local government health authority, except that in the case of any city, county, or other local government in which there is a single agency other tha n the health authority charged with responsibility for enforcing ordinances or laws relating to the abatement of air pollution, it means such other agency; and

(c) The term "State" means a State or the District of Columbia.

Sec. 7. Nothing contained in this Act shall limit the authority of any department or agency of the United States to conduct or make grants-in-aid or contracts for research and experiments rela ting to air pollution under the authority of any other law.

APPROVED JULY 14, 1955.

AN ACT

To extend and strengthen the Water Pollution Control Act.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Water Pollution Control Act (33 U.S.C. 466-466j) is hereby amended to read as follows:

"DECLARATION OF POLICY

"Section 1. (a) In connection with the exercise of jurisdiction over the waterways of the Nation and in consequence of the benefits resulting to the public health and welfare by the prevention and control of water pollution, it is hereby declared to be the policy of Congress to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution, to support and aid technical research relating to the prevention and control of water pollution, and to provide Federal technical services and financial aid to State and interstate agencies and to municipalities in connection with the prevention and control of water pollution. To this end, the Surgeon General of the Public Health Service shall administer this Act through the Public Health Service and under the supervision and direction of the Secretary of Health, Education, and Welfare.

"(b) Nothing in this Act shall be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters (including boundary waters) of such States.

. . . . . .

"RESEARCH, INVESTIGATIONS, TRAINING, AND INFORMATION

"Sec. 4. (a) The Surgeon General shall conduct in the Public Health Service and encourage, cooperate with, and render assistance to other appropriate public (whether Federal, State, interstate, or local) authorities, agencies, and institutions, private agencies and institutions, and individuals in the conduct of, and promote the coordination of, research, investigations, experiments, demonstrations, and studies relating to the causes, control, and prevention of water pollution. In carrying out the foregoing, the Surgeon General is authorized to-

"(1) collect and make available, through publications and other appropriate means, the results of and other information as to research, investigations, and demonstrations relating to the prevention and control of water pollution, including appropriate recommendations in connection therewith;

"(2) make grants-in-aid to public or private agencies and institutions and to individuals for research or training projects and for demonstrations, and provide for the conduct of research, training, and demonstrations by contract with public or private agencies and institutions and with individuals without regard to sections 3648 and 3709 of the Revised Statutes;

"(3) secure, from time to time and for such periods as he deems advisable, the assistance and advice of experts, scholars, and consultants as authorized by section 15 of the Administrative Expenses Act of 1946 (5 U.S.C.55a);

"(4) establish and maintain research fellowships in the Public Health Service with such stipends and allowances, including traveling and subsistence expenses, as he may deem necessary to procure the assistance of the most promising research fellowships: Provided, That the total sum authorized to be appropriated for any fiscal year for fellowships pursuant to this subparagraph shall not exceed $100,000; and

"(5) provide training in technical matters relating to the causes, prevention, and control of water pollution to personnel of public agencies and other persons with suitable qualifications.

"(b) The Surgeon General may, upon request of any State water pollution control agency, or interstate agency, conduct investigations and research and make surveys concerning any specific problem of water pollution confronting any State, interstate agency, community, municipality, or industrial plant, with a view of recommending a solution of such problem.

"c) The Surgeon General shall, in cooperation with other Federal, State, and local agencies having related responsibilities, collect and disseminate basic data on chemical, physical, and biological water quality and other information insofar as such data or other information relate to water pollution and the prevention and control thereof.

ABOUT THE COMMITTEE MEMBERS

DR. GAYLORD W. ANDERSON is Mayo Professor and Director of the School of Public Health, University of Minnesota. A native of Minneapolis, he is married and has one child. His education includes a Dartmouth A.B., studies at the Sorbonne and Zurich, and degrees of M.D. and Dr.PH from Harvard. Before going to the University of Minnesota in 1937 he was for several years an epidemiologist and director of the division of communicable diseases in the Massachusetts State Department of Public Health. During World War II he served in the Army Medical Corps. He is a past president of the Public Health Association and the Epidemiological Society, and a member of the American Medical Association.

LIEUTENANT COLONEL JACK C. CARMICHAEL is Chief of the Engineering Branch and the Environmental Health Laboratory Branch, Office of the Surgeon, Headquarters Air Materiel Command, Wright-Patterson Air Force Base, Ohio. He is from Dodd City, Texas, married, and hasthree children. After attending Marion Military Institute, Marion, Alabama, he took a B.S. in civil engineering at the University of Texas and an M.S. in engineering at The Johns Hopkins University. Since 1943 he has served progressively in Army and Air Force sanitary engineering positions in the U.S. and Germany. Among his memberships are APHA, AIHA, Military Engineers, Conference of Federal Sanitary Engineers (board of directors), and American Conference of Governmental Industrial Hygienists. For the National Research Council he is a member of the Committee on Toxicology and the Committee on Hearing and Bio-Acoustics.

DR. JESS C. DIETZ is Associate Professor of Sanitary Engineering at the University of Illinois. Born at Fond du Lac, Wisconsin, he is married and has three children. From the University of Wisconsin he holds B.S., M.S., and Ph.D. degrees in civil engineering. Before and after his war service with the Army Engineers, he taught at Wisconsin, going to Illinois in 1947. Among his memberships are ASCE, AWWA, SAME, ASEE, NSPE, and APHA. Incidentally, he holds the Bronze Star Medal and the French Croix de Guerre.

PROFESSOR JOHN E. KIKER, JR., Department of Civil Engineering, University of Florida, received his B.S. from M.I.T. and an M.C.E. degree from N.Y.U. He has also studied chemical engineering at Georgia Tech and law at Emory University. Born in Americus, Georgia, he is married and has three children. Before going into teaching he had some years of engineering experience in Florida, Indo-China, Maryland, Venezuela, and New York, plus war service as chief of a sanitary engineering section in the Army. He belongs to about two dozen professional societies, has held office in many, and is author of a number of publications on sanitary engineering.

ABOUT THE COMMITTEE MEMBERS

DR. ERMAN A. PEARSON is Associate Professor of Sanitary Engineering at the University of California and an active consulting engineer. He has a B.S. in civil engineering from the University of Washington and S.M. and Sc.D. degrees in sanitary engineering from M.I.T. He is married and has one child. During World War II he was a tooling engineer for Boeing Airplane Company. Since then he has worked extensively in industrial waste control projects, and he holds a patent for treatment and reuse processes for waste water in the beet sugar industry. For the Chemical Corps he has made studies of gross decontamination. He has a number of publications on water pollution control, refuse collection, and industrial waste problems. He belongs to four professional honor societies.

PROFESSOR GEORGE SCHROEPFER is in the Department of Sanitary Engineering, University of Minnesota, where he has served since 1945. Previously he was active in the design, construction, and operation of the Minneapolis-St. Paul sewage collection and treatment project, rising from Junior Engineer to Chief Engineer. He has been a consultant on various projects during and since World War II, officer of several engineering associations, and author of numerous papers in his field. He has received many service awards, including the Rudolf Herring Award of ASCE. He is married and has two children.

DR. LESLIE SILVERMAN is Associate Professor of Industrial Hygiene Engineering at Harvard and a consulting engineer in air pollution control, industrial hygiene, and industrial ventilation. Born in Chicago, he is a graduate of the University of Illinois, has an M.S. from Rutgers in mechanical engineering, and an S.M. and Sc.D. from Harvard in industrial hygiene engineering. He is author of two books, numerous papers, articles, and reports, member of several professional societies and committees, and was a State Department technical delegate to the Geneva Atoms-for-Peace Conference in 1955.

CLARENCE I. STERLING, JR. is Director of the Division of Sanitary Engineering of the Massachusetts State Department of Public Health. From Union City, New Jersey, he is a graduate of Lafayette College, married, and has three sons. He has been with the State of Massachusetts since 1927 except for an interlude of wartime and postwar service with the Institute of Inter-American Affairs in South America and Washington, D.C. Since, he has served as a consultant on sanitation studies in Alaska and abroad. Currently he is Chairman of the Conference of State Sanitary Engineers. He is a member of several engineering and health associations, author of various papers on his investigations, and is an instructor in public health practice at Harvard.

ABOUT THE COMMITTEE MEMBERS

KENNETH S. WATSON is Consultant in Water Management and Waste Control, General Electric Company. A graduate of West Virginia University, he has previously served with the West Virginia Water Commission, the Ohio River Valley Water Sanitation Commission, and the Interstate Commission on the Potomac River Basin. He has written many papers on industrial waste treatment, is a member of many societies and committees, and is past chairman of the National Technical Task Committee on Industrial Wastes. He is a Lieutenant Colonel in the Army Reserve Corps, commanded an Engineer Combat Battalion in World War II, and served in the Military Government of the City of Frankfurt, Germany.

DR. ORAM C. WOOLPERT is Executive Director of The Ohio State University Research Foundation at Columbus, Ohio. He was born in Kokomo, Indiana, is married, and has two children. He holds degrees of A.B. from Harvard, Ph.D. in bacteriology from the University of Chicago, and M.D. from Rush Medical College. Subsequently he became a professor of bacteriology a nd medicine at Ohio State and later technical director of the biological warfare research laboratories of the Chemical Corps at Fort Detrick, Maryland. He served in the infantry in World War I, in the Medical Corps in World War II, and is now a member of the Navy Medical Reserve. His professional associations include the Society of American Bacteriologists and the Society of Experimental Biology, and he is the author of papers in the fields of pathogenic bacteriology, staphylococcus food poisoning, and virology.